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Release B (EOS-AM1/Landsat-7) SDPS/CSMS IDR Review Guide for the ECS Project

October 1995

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Abstract

This Review Guide for the Release-B (EOS AM-1/Landsat-7) SDPS/CSMS Incremental Design Review (IDR) is provided to assist in reviewing the IDR documentation set and to prepare for participation in the upcoming IDR. The Release-B IDR milestone is similar to Preliminary Design Review (PDR) for the earlier Release. The guide presents a list of the documents prepared as part of the IDR, a list of other supporting documents, and a road map through the documentation set for different groups of readers. Some methodological notes are included, as well as an update on the organization of ECS development activity. It also includes the objectives of the IDR at a high level, the scope of Release-B, and a draft agenda for the briefings to be presented October 30 - November 3, 1995.

Keywords: CSMS, SDPS, IDR, Release-B, Landsat-7, AM-1

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1. Introduction

1.1 Purpose

This technical paper is provided to assist in reviewing the Release B (EOS-AM 1/Landsat) SDPS/CSMS Incremental Design Review (IDR) documentation set and to prepare for participation in the upcoming Release B IDR session. Participation in this review is important and appreciated.

This document is not a deliverable item under the EOSDIS Core System (ECS) contract, and is provided solely as a convenience for the reviewers. Accordingly, this technical paper itself is not subject to comment.

This guide contains material addressing the following topics:

- ECS development organizations and the Release B IDR
- IDR Objectives
- Scope of Release B
- Summary of organizations participating in IDR
- IDR deliverable documents
- Other relevant documents
- Documentation road map
- Draft agenda for the IDR briefings October 30 - November 3, 1995

1.2 ECS Development Organizations

In an effort to maximize the communication and coordination between the Communications and Systems Management Segment (CSMS) and the Science and Data Processing Segment (SDPS), ECS reorganized those development organizations after their respective Preliminary Design Reviews into a single organization, the Science and Communications Development Office (SCDO). This organization is organized by system release; Interim Release 1 (TRMM Infrastructure Release), Release A (TRMM Release) and Release B (EOS-AM1/Landsat-7 Release). Accordingly, the upcoming Release B IDR covers both segments. Design and development for the Flight Operations Segment (FOS) remains as a distinct organization, while still exploiting the infrastructure services provided by the CSMS components. FOS held a combined Release A/B CDR in October, 1995. FOS-unique CSMS activity (e.g., the EOC LAN design) was documented and presented as part of the FOS CDR.

1.3 IDR Objectives

The objectives of the Release B IDR are to demonstrate that the CSMS and SDPS designs satisfy Release B allocated requirements, to present prototyping results, and to evaluate the technical risks associated with development of the segments and their elements. This is accomplished by:

- Reviewing requirements changes since PDR
- Evaluating the progress, technical adequacy, and risk resolution (on a technical, cost, and schedule basis) of the selected design approaches
- Evaluating trade-offs associated with cost vs. performance, build vs. buy, and the allocation of segment functions to hardware and software
- Determining the segments' compatibility with ECS performance requirements
- Establishing the existence and compatibility of the physical and functional interfaces among the segments and elements and other items of equipment, facilities, computer software, and personnel
- Evaluating the results of modeling and simulation studies
- Demonstrating how prototyping results are being applied to the design and presenting plans for any further prototyping evaluations that are needed before finalizing the design
- Assessing growth potential of the design elements included in the review
- Evaluating the progress, consistency, and technical adequacy of the selected software design and test approach, comparing the current estimate of lines of code with the estimate at the PDR, and assessing the compatibility between software requirements and preliminary design
- Evaluating the adequacy of any hardware purchase plans, including the hardware product specifications.

The accomplishment of many of the tasks listed above must be assessed from the IDR documentation. The IDR sessions will be conducted with a different emphasis from the points listed above. In consultation with ESDIS on the goals for the IDR, the IDR sessions present an end-to-end system view using scenarios, plus a selection of design topics illustrated by those scenarios. As a result of the emphasis on scenarios, not all of the above items will be presented; however, they are addressed in the IDR documentation.

1.4 Scope of Release B

Release B expands the capabilities of Release A by providing full functionality and services required for AM-1 launch and data operations, for supporting Landsat-7 operations, and for providing on-going operational support for TRMM. Release B also provides capabilities to support the COLOR, ADEOS II, RADAR ALT, ACRIM, and METEOR missions. Release B also provides the means by which ECS users may gain access to and receive Synthetic Aperture Radar (SAR) products from the ERS-1, ERS-2, JERS-1, and the RADAR SAT missions, which are processed and archived at the Alaska SAR Facility. As part of Release B, the Data Assimilation Office becomes part of the ECS at the GSFC ECS DAAC.

Release B is deployed at eight sites - the original Release A sites (SMC and ECS DAAC at GSFC; ECS DAACs at MSFC, LaRC and EDC), plus four newly commissioned ECS DAAC sites - the National Snow and Ice Data Center (NSIDC), the Jet Propulsion Laboratory (JPL), the Oak Ridge National Laboratory (ORNL), and the Alaska SAR Facility (ASF).

Release A and B software is also delivered but not acceptance tested at a ninth ECS DAAC site, the Socio-Economic Data and Applications Center (SEDAC), at the Consortium for International Earth Science Information Network in Saginaw, Michigan. Table 1-1, ECS Release B DAAC and SMC Support Enhancements, provides a summary of the DAAC and SMC support provided in Release B versus that provided in Release A. Release B also includes the EOS Operations Center (EOC); the EOC was separately reviewed at a PDR in December 1994 and a CDR in October 1995.

The Release B communications interfaces include the National Aeronautics and Space Administration (NASA) Science Internet (NSI), the NASA Communications (NASCOM) Operational Local Area Network (NOLAN), and the EOSDIS Backbone Network (EBnet). These interfaces are physically located at the SMC and at the ECS GSFC, MSFC, LaRC, EDC, NSIDC, JPL, ORNL, ASF, and SEDAC DAAC sites. The communications networks connect ECS to data providers at the Sensor Data Processing Facility (SDPF), the ECS Data and Operation System (EDOS), the Landsat Processing System (LPS), the NOAA ADC, the TRMM Science Data and Information System (TSDIS), the EOSDIS Version 0 system, the processing facility at the ASF, and the sources of Level-0 data for COLOR, ADEOS II, RADAR ALT, ACRIMSAT and the METEOR missions. The primary data users for Release B are the science user community who access the nine ECS DAACs (including SEDAC), the SCFs, Landsat IAS, and the ASTER GDS.

1.5 Participating Organizations

ECS has a large number of stakeholders who will be represented at the Release B IDR, including:

- EOS Advisory Panel
- DAAC managers, scientists, engineers, user working groups
- ECS tirekickers
- Instrument Teams
- SDPS Design Working Group, Data Model Working Group, Ad Hoc Working Groups on Production and Consumers
- ESDIS (SISDO, DSNO, FOS, Systems Engineering, the Project Office)
- NASA headquarters
- TRMM, AM-1, Landsat 7
- EDOS, EBnet
- NOAA
- International Partners

- Other ECS organizations (M&O, FOS, Quality Office, Systems Management Office, IATO)
- IV&V contractor

Table 1-1. ECS Release B DAAC and SMC Support Enhancements

Site	Release A Capabilities	New Release B Capabilities Deployed at Each Site
SMC	System Performance Monitoring & Analysis; WAN Management; and System Coordination Support.	SMC Services Extended to ASF, JPL, NSIDC, ORNL & SEDAC; and Interoperability with ASTER GDS.
GSFC DAAC	TRMM Mission Support; VIRS Data Ingest, Archive & Distribution; Ingest Ancillary Data; AM-1 Interface Testing; AM-1 MODIS Science Software I&T; V0 Data Migration & Interoperability; TOMS Ozone Data Ingest and Archive; and System Resource Management.	AM-1 Mission Support; MODIS Level-0 Data Ingest; MODIS Levels 1A, 1B, 2, 3 & 4 Production and Distribution; MODIS Levels 1A, 1B, 2 & 3 Archive; COLOR Science Software I&T; COLOR Level-0 Ingest; COLOR Level 1-3 Production, Archive & Distribution; Interoperability with ASTER GDS; Interoperability with New DAACs; and DAS Level 4 Production, Archive and Distribution
LaRC DAAC	TRMM Mission Support; TRMM CERES Data Ingest, Production, Archive & Distribution; V0 Data Migration & Interoperability; AM-1 Interface Testing; RMM & AM-1 CERES, and MISR & MOPITT Science Software I&T; SAGE Aerosol & Ozone Data, and ISCCP Data Ingest and Archive; System Resources Management; and NOAA Ancillary Data Ingest.	AM-1 Mission Support; AM-1 CERES, MISR & MOPITT Level-0 Data Ingest; AM-1 CERES, MISR & MOPITT Level 1-3 Production, Archive and Distribution; METEOR SAGE III Science Software I&T; SAGE III Level-0 Ingest; SAGE III Level 1-2 Production, Archive & Distribution; ACRIM Science Software I&T; ACRIM Level-0 Ingest; ACRIM Level 1A Production, Archive & Distribution; Interoperability with ASTER GDS; and Interoperability with New DAACs.
MSFC DAAC	TRMM Mission Support; LIS Level-0 Data Ingest, Production, Archive & Distribution; V0 Data Migration & Interoperability; SSM/i, GPCC & GPCP Ingest & Archive; PR, TMI & GV Data Ingest, Archive & Distribution; LIS Science Software I&T; and System Resource Management.	Inter-Operability with ASTER GDS; and Interoperability with New DAACs.
EDC DAAC	Landsat-7 Interface Testing: Landsat-7 Level-0R Data Ingest; ASTER/MODIS Science Software I&T; Ancillary Data Ingest; and System Resource Management.	AM-1 Mission Support; Landsat-7 Mission Support; ASTER Level 1A &1B Data Ingest; ASTER Level 2 Production, Archive & Distribution; MODIS Level 2-4 Ingest; MODIS Levels 3 & 4 Production, Archive & Distribution; Landsat-7 Data Archive; Landsat-7 Data Access & Ordering Support; Inter-Operability with ASTER GDS; Interoperability with New DAACs; and V0 Data Migration & Interoperability; and System Resource Management.
ASF DAAC	Not Deployed.	Interface to the Alaska SAR Component for the Access & Distribution of Level 0 ERS-1, JERS-1, ERS-2, and RADARSAT Data; Interface to ASF Production Systems for Generation of SAR Higher-Level Products; Archive of Selected ERS-1, JERS-1, ERS-2, and RADARSAT Level 1&2 Data; Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Migration & Interoperability; and System Resource Management. Interoperability with CSA.
JPL DAAC	Not Deployed.	ADEOS II SeaWinds Science Software I&T; SeaWinds Level-0 Data Ingest; SeaWinds Level 1B & 2 Production, Archive & Distributin; Non-Redundant AMSR Level-2 Ingest; RADAR ALT DFA Science Software I&T; DFA Level-0 Ingest; DFA Level 1-4 Production Archive & Distribution; RADAR ALT MR Science Software I&T, MR Level 1B Production Archive & Distribution; Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Migration & Interoperability; and System Resource Management.
NSIDC DAAC	Not Deployed.	AM-1 Mission Support; MODIS Level 2 Data Ingest; Archive and Distribution; MODIS Level 3 Production, Archive & Distribution; Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Migration & Interoperability; and System Resource Management.
ORNL DAAC	Not Deployed.	Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Interoperability; and Limited System Resource Management. Interface to ORNL archiving components for Distribution of ORNL Products. (ECS provides a subset of DAAC hardware - ORNL provides and integrates the rest)
SEDAC	Not Deployed.	Interoperability with Other DAACs (ECS provides software only - SEDAC integrates)
EOC	Not Deployed	AM-1 Operations (Planning and Scheduling, Command and Control of AM-1 platform and instruments)

1.6 Additional Information

All documents identified in this technical paper are available in softcopy via the ECS Data Handling System (URL = http://edhs1.gsfc.nasa.gov). The EDHS also provides softcopy of such useful background material as the ECS Functional and Performance Requirements Specification ("Level 3s"), the ECS IRDs and ICDs, and the overall ECS System Design Specification (as issued for the 6/94 System Design Review). If there are problems accessing these documents please contact the EDHS Administrator (edhsadmin@eos.hitc.com).

Questions concerning distribution or control of this document should be addressed to:

Data Management Office
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Upper Marlboro, MD 20774

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2. IDR Documentation

2.1 Introduction

A large array of technical documentation has been provided to EOSDIS and its partners to allow a careful review of the ECS Release B SDPS/CSMS preliminary design. To maximize the effectiveness of the Incremental Design Review, reviewers are encouraged to examine the materials pertinent to their efforts and disciplines, and be prepared to ask questions either as an active participant at the IDR, or through the Review Item Discrepancy (RID) process.

In order to understand the relationships between the many documents developed for IDR, two graphical devices have been developed. Appendix A, Release B Document Tree, illustrates the hierarchical relationship between: 1) the System documents vs. the release specific documents, and 2) the requirements and operations concepts documents and the various volumes of the segment design specification. The other graphical depiction of document relationships is shown in Figure 2-1, Systems Engineering Verification. Figure 2-1 shows the relationships between the Requirements Specifications, the Operations Concept Document (OCD) and the Design Specifications.

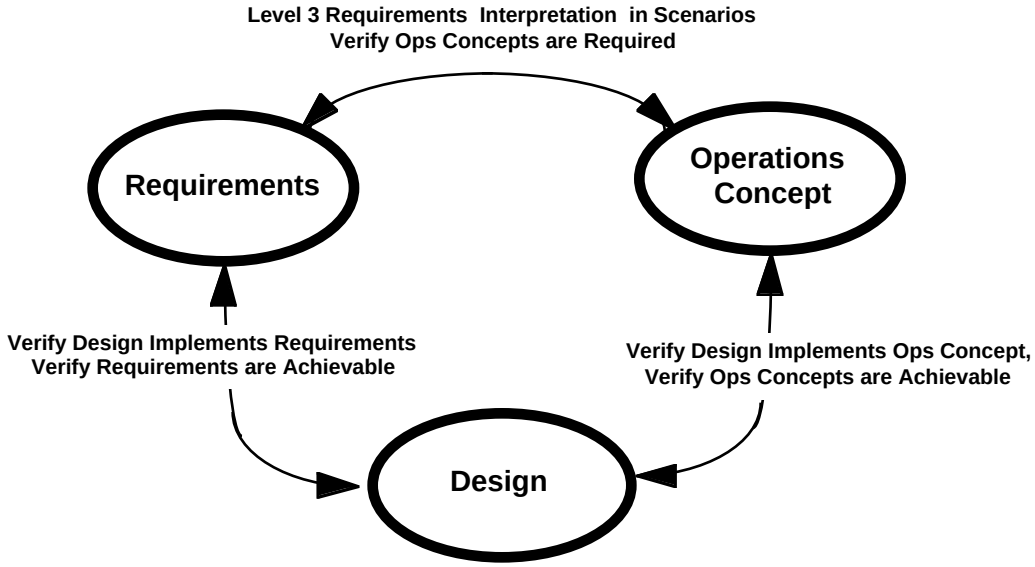

Figure 2-1. Systems Engineering Verification

These relationships provide a mechanism for verification of each systems engineering product. The relationships are summarized below:

- Interpretation of the Level 3 Requirements is provided through a set of core scenarios in the Release B Operations Concept Document. The necessity for the services illuminated in the scenarios is verified by a mapping of Scenarios to Level 3 requirements in Appendix B of the OCD.
- The completeness and necessity of the segment designs are verified by a two way mapping between the Level 4 requirements and design components in the Segment Design specifications.
- The relationship between the operations concepts and the design is verified by the commonality of scenarios in the OCD (604-CD-002-001) and the design scenarios in the SDPS/CSMS Internal Interface Control Document (313-CD-008-001).

2.2 Review Documentation

ECS personnel have provided six major categories of technical information for review which thoroughly describe the preliminary design the SDPS/CSMS Release B. These categories include:

2.2.1 Segment Requirements Specification

Segment requirements for CSMS and SDPS are specified in a combined SDPS/CSMS Requirements specification. In addition to the Level 4 Requirements, this document provides information on interfaces, performance and data type services.

304-CD-005-001	Release B SDPS/CSMS Requirements Specification for the ECS Project

2.2.2 Operations Concept Document

A working draft of the Release B OCD is being delivered for IDR. This document will support an Operations Workshop that will be conducted between IDR and CDR. The Release B OCD will be reissued as Final for CDR.

604-CD-002-001	Operations Concept for the ECS Project: Part 2B - ECS Release B

2.2.3 Software and Hardware Design Documents

The primary design volume, DID 305, has been broken into 20 sub-volumes, falling into four categories: overview, subsystem design, facility-unique hardware designs, and (object) data dictionary. Also included in this group of documents is DID 313, which collects all of the public internal interfaces in the SDPS/CSMS Release B system; these include inter-subsystem interfaces, and inter-configuration item interfaces. In addition, this document contains a mapping of all external interfaces (see External Interfaces section) to the corresponding public internal interface object.

Note: The Release B design incorporates substantial reuse from Release A. As a result, portions of the design material reflect Release A's detailed design. The unique-to-B design additions/extensions reflect the current preliminary design level of detail. Typographic conventions are used to distinguish Release A reuse from new Release B design.

305-CD-020-001	Release B SDPS/CSMS Design Specification Overview for the ECS Project
305-CD-021-001	Release B SDPS Client Subsystem Design Specification (CLS)
305-CD-022-001	Release B SDPS Interoperability Subsystem Design Specification (IOS)
305-CD-023-001	Release B SDPS Data Mgt. Subsystem Design Specification (DMS)
305-CD-024-001	Release B SDPS Data Server Subsystem Design Specification (DSS)
305-CD-025-001	Release B SDPS Ingest Subsystem Design Specification (INS)
305-CD-026-001	Release B SDPS Planning Subsystem Design Specification (PLS)
305-CD-027-001	Release B SDPS Data Processing Subsystem Design Specification for (DPS)
305-CD-028-001	Release B CSMS Communications Subsystem Design Specification (CSS)
305-CD-029-001	Release B CSMS System Management Subsystem Design Specification (MSS)
305-CD-030-001	Release B GSFC DAAC Design Specification for the ECS Project
305-CD-031-001	Release B LaRC DAAC Design Specification for the ECS Project
305-CD-032-001	Release B MSFC DAAC Design Specification for the ECS Project
305-CD-033-001	Release B EDC DAAC Design Specification for the ECS Project
305-CD-034-001	Release B ASF DAAC Design Specification for the ECS Project
305-CD-035-001	Release B NSIDC DAAC Design Specification for the ECS Project
305-CD-036-001	Release B JPL DAAC Design Specification for the ECS Project
305-CD-037-001	Release B ORNL DAAC Design Specification for the ECS Project
305-CD-038-001	Release B SMC Design Specification for the ECS Project
305-CD-039-001	Release B Data Dictionary for the ECS Project Subsystem Design Specification
313-CD-006-001	Release B SDPS/CSMS Internal Interface Control Document

2.2.4 Database Design

The data base designs for CSMS and SDPS are specified in a combined SDPS/CSMS data base and schema document (to be delivered in accordance with the CDRD at IDR + 30 days):

311-CD-008-001	Release B SDPS/CSMS Database Design & Schema for the ECS Project

2.2.5 External Interfaces

Eleven External Interface Control Documents (ICDs) are applicable to the Release B IDR. A number of these were developed specifically for Release B IDR and others were developed previously.

209-CD-001-001	Interface Control Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI)
209-CD-002-001	Interface Control Document Between EOSDIS Core System (ECS) and the ASTER Ground Data System
209-CD-005-003	Interface Control Document Between EOSDIS Core System (ECS) and Science Computing Facilities (SCF)
209-CD-006-003	Interface Control Document Between EOSDIS Core System (ECS) and Affiliated Data Center (ADC)
209-CD-007-002	Interface Control Document Between EOSDIS Core System (ECS) and TRMM Science Data and Information System (TSDIS)
209-CD-008-002	Interface Control Document Between EOSDIS Core System (ECS) and Goddard Space Flight Center (GSFC) Distributed Active Archive Center (DAAC) for the ECS Project
209-CD-009-002	Interface Control Document Between EOSDIS Core System (ECS) and Marshall Space Flight Center (MSFC) Distributed Active Archive Center (DAAC) for the ECS Project
209-CD-011-002	Interface Control Document Between the EOSDIS Core System (ECS) and the Version 0 System for the ECS Project
209-CD-013-002	Interface Control Document Between EOSDIS Core System (ECS) and Landsat-7 for the ECS Project
209-CD-021-001	Interface Control Document Between EOSDIS Core System (ECS) and Alaska SAR Facility (ASF) DAAC
209-CD-022-001	Interface Control Document Between EOSDIS Core System (ECS) and Oak Ridge National Laboratory (ORNL) DAAC

2.2.6 Other Contractual Documents

This section contains other contractual documents relevant to IDR that do not fit into the categories above.

210-CD-001-003	Risk Assessment Report
211-CD-002-001	Release B Trade-Off Studies Analytical Data
220-CD-001-004	Communications Requirements for the ECS Project
307/329-CD-004-001	Release B SDPS Development/Release Plan for the ECS Project
307/329-CD-005-001	Release B CSMS Development/Release Plan for the ECS Project
319-CD-006-001 402-CD-003-001	Release B System and Segment Integration & Test Plans for the ECS Project
403-CD-002-001	Release B Verification Specification
513-CD -002-001	Release B Hazard Analyses
514-CD-002-001	Security- Sensitive Items List
515-CD -002-001	Release B Availability Models/Predictions for the ECS Project
516-CD -002-001	Release B Reliability Predictions
518-CD -002-001	Release B Maintainability Predictions
522-CD-002-001	Release B Integration & Inspection Flow Plan
614-CD-001-003	Developed Software Maintenance Plan for the ECS Project
615-CD-001-002	Special Maintenance & Test Equipment for the ECS Project
627-CD-001-002	Security Risk Management Plan for the ECS Project

2.3 Other Documentation

These documents have been previously released but may be useful to the IDR reviewers.

152-TP-001-002	Acronyms for the ECS Project
175-WP-001-001	HDF-EOS Primer for Version 1 EOSDIS
210-TP-001-003	Technical Baseline for the ECS Project
221-TP-001-002	Process vs. Store Technical Paper
222-TP-003-006	Release Plan Content Description for the ECS Project
420-TP-002-001	The ECS Ingest Subsystem Design Analysis
420-TP-008-001	ECS Common Desktop Environment Migration Study
440-TP-003-001	Science Software Data Server Access: A Trade-off Study Analysis
440-TP-004-001	Guaranteed Level of Service
440-TP-005-001	Physical Access and Media Management for the ECS Project
440-TP-006-001	Production Topologies: A Trade-off Study Analysis
440-TP-007-001	Production Platform Families for the ECS Project
440-TP-008-001	Distributed and Parallel Processing for ECS Science Algorithms: A trade-off Study Analysis
440-TP-009-001	Network Attached Storage Concepts & Industry Survey for the ECS Project
440-TP-010-001	DADS MR-AFS Proof of Concept Results for the ECS Project
440-TP-011-001	Manual vs. Automated Data Ingest Analysis
440-TP-014-001	ECS Ingest Subsystem Topology Analysis
440-TP-015-001	PDPS Scheduling COTS for Planning and Data Processing Trade Study
441-TP-002-001	Hypertext Document Reading Tool Trade Study: Summary of Evaluation Results
543-TP-001-003	A Cost Comparison of Transferring Inter-DAAC Data via Media versus the ESN WAN
410-TD-001-002	ECS User Interface Style Guide, Version 5
410-TP-001-001	ECS Object Modeling Technique Tutorial

2.4 Documentation Road map

As is clear from the preceding sections, The ECS Release B Team has prepared a large amount of documentation for the SDPS/CSMS Release B IDR. One document is singled out as a design overview document, DID 305-CD-020-001, *Release B SDPS/CSMS Design Specification Overview for the ECS Project.* This document provides an architectural view of the system at the subsystem and configuration item level, a reference (non-DAAC specific) hardware description, and a chapter on design topics which span all or many subsystems (e.g., distributed communications architecture, security architecture, external interface architecture, systems management architecture, and user interface architecture. It is recommended reading for all audiences.

The following table indicates the likely level of review interest associated with the SDPS/CSMS IDR document deliveries against the following readership groups:

OPERations—DAAC Managers, M&O, User Services, TRMM ground system, EDOS, flight team

USER—EOSDIS science users

NET-HW—EOSDIS networks ("NT," EBnet, NSI, PSCN, V0, etc.) and hardware

DEVelopers—SDPS, FOS, CSMS

SE—system engineering interests (SMO, IATO, IV&V, ...)

MGR—various management interests in ESDIS and ECS

Table 2-1. IDR Documentation Roadmap (1 of 2)

DID Number	Short Title	OPER	USER	NET-HW	DEV	SE	MGR
209-CD-0xx-00x	ICDs Between ECS and external entities (See Section 2.2.5)	X		X	X	X	
210-CD-001-003	Risk Assessment Report					X	X
211-CD-002-001	Trade-Off Studies Analytical Data				X	X	
220-CD-001-004	Communications Requirements	X		X		X	
304-CD-005-001	System Requirements Specification	X	X	X	X	X	X
305-CD-020-001	SDPS/CSMS Design Specification Overview	X	X	X	X	X	X
305-CD-021-001 through 305-CD-029-001	Subsystem Design Specifications (See Section 2.2.3)				X	X	
305-CD-030-001 through 305-CD-038-001	Site Design Specifications (See Section 2.2.3)	X		X	X	X	

Table 2-1. IDR Documentation Roadmap (2 of 2)

DID Number	Short Title	OPER	USER	NET-HW	DEV	SE	MGR
305-CD-039-001	Data Dictionary for the ECS Project Subsystem Design Specification				X	X	
307/329-CD-004-001	SDPS Development/Release Plan				X	X	X
307/329-CD-005-001	CSMS Development/Release Plan				X	X	X
311-CD-008-001	Release B SDPS/CSMS Database Design & Schema for the ECS Project (available ~ 11/30)				X	X	
313-CD-006-001	SDPS/CSMS Internal Interface Control Document				X	X	
319-CD-006-001 402-CD-003-001	System and Segment Integration & Test Plans					X	
403-CD-002-001	Verification Specification					X	
513-CD -002-001	Hazard Analyses	X				X	
514-CD-002-001	Security- Sensitive Items List	X		X		X	
515-CD -002-001	Availability Models/Predictions for the ECS Project	X				X	
516-CD -002-001	Reliability Predictions	X				X	
518-CD -002-001	Maintainability Predictions	X				X	
522-CD-002-001	Integration & Inspection Flow Plan					X	
604-CD-002-002	Operations Concept: Part 2B - Release B	X	X		X	X	X
614-CD-001-003	Developed Software Maintenance Plan	X					X
615-CD-001-002	Special Maintenance & Test Equipment	X					
627-CD-001-002	Security Risk Management Plan	X			X	X	X

3. Incremental Design Review

3.1 Introduction

The approach to the Incremental Design Review was modified from the baseline, i.e. ECS SOW, definition to address the DAAC and user community desire to see an end-to-end presentation of ECS from the viewpoints of the various users. This modified approach to IDR was developed by the ESDIS Design Review Process Improvement Team and the ECS Release B Team.

The revised approach to IDR has four main parts: Push Scenarios, Pull Scenarios, Push + Pull Scenarios (See Figure 3-1) and Program Management Topics. Each of the three scenario portions have the same sub-structure. The Scenario sections begin with an extended presentation of system scenarios followed by a series of design drill downs. The scenarios present specific system functionality, e.g., pull functions. Each scenario will present the system operations from four perspectives: science end user, DAAC operations (including User Services), Data Providers, and SMC. The design drill downs present the preliminary design for selected design topics that are related to some steps of the scenario.

The high-level schedule for the scenario presentations can be found in Appendix B. A detailed draft agenda will be published the week preceding the IDR. The following sections describe the contents of each of the scenario topics.

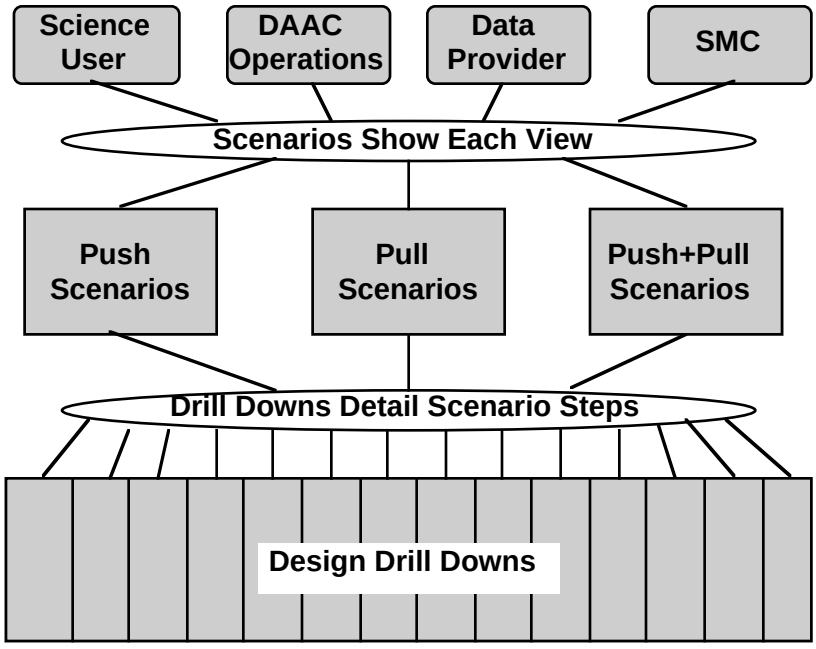

Figure 3-1. Approach to IDR

3.2 Push Scenarios

The push scenarios describe the end-to-end behavior of the Data Production (push side) of the ECS from the perspective of a number of different types of users at several key stages of the system lifetime. The emphasis is on describing the high-level behavior of the ECS from science software integration through to full-up data production, and making products available to the science community. The push scenarios presentations are driven by the following high-level scenario drivers: 1) DAAC activities are not static, 2) Science data products are not static, 3) Science data users are not static, and 4) the ECS must be flexible enough to cope with evolving uses of both the DAAC and its data holdings.

Candidate scenarios illustrate the following end-to end push functions from the perspective of DAAC operations, the science end-user, the data providers, and the SMC during three phases: science software installation, production shakedown, and nominal operations:

- Science Software Maintenance
  - Installation and maintenance of production software
- Data Collection Maintenance
  - Definition and maintenance of science data products and document collections
- Calibration/Validation & QA
  - Data validation and long-loop QA
- Data Production and Planning
  - Data production and resource management

3.3 Pull Scenarios

The pull scenarios cover the functions which support the end science user in finding EOSDIS services, reviewing the ECS holdings, and requesting ECS data and services. The emphasis is on how the user can use the various tools in the ECS Client Subsystem to access the Advertising Service, Data Management Subsystem and the Data Server Subsystem.

There is a difference in approach for the pull scenarios compared to the push scenarios. The push scenarios can be defined as centered around the operations which occur at the DAACs and the push scenarios have a somewhat nominal timeline centered around the launch. The pull scenarios do not have similar centers for the functionality or time on which to define the scenarios. In fact, the purpose of the pull side design is to obviate the need for a nominal user scenario. Users must be able define their own individual workflow based on flexibility of the ECS pull side design. Pull side scenarios have been defined from design drivers for the pull side. Based on these design drivers a list of scenarios has been developed.

Topics for pull scenarios may include:

- Advertising Service
  - Demonstrate how the advertising service supports access to Extended Data Providers.

- Quick Access
  - Demonstrate ability to traverse Client tools in various, ad hoc workflows to access data and services in a seamless fashion.
- Coincident Query
  - Demonstrate space and time coincident search which requires DIM to plan and execute a query across several sites
- Data Acquistion Requests.
  - Development of DAR through interaction with GDS and related processing on demand for Level 2 products.
- Traveling User
  - Demonstrates how sessions are handled for a user who must conduct sessions from geographically different locations.

3.4 Push + Pull Scenarios

The push + pull scenarios are intended to stress the design and address questions regarding resiliency. They consist of abnormal events that the system would not be expected to handle at full performance. The push + pull scenarios show that the system continues to function under these stressed conditions but:

- System performance may be temporarily degraded
- Operator intervention may be required
- The system must provide options to tailor the response

Four push + pull scenarios have been prepared for the IDR:

- Spectacular event scenario
  - 10,000 users descend on the system to access interesting images
- Huge data request scenario
  - A single data request requires sending terabytes of data
- High priority data request scenario
  - A large data processing/distribution request must be filled quickly
- Science software error scenario
  - An error is discovered in the science software requiring notification to users, correction of the error, and reprocessing

3.5 Draft Agenda

The draft agenda for the IDR presentation week is presented in "week-at-glance" format in Appendix B. Participants should be aware that briefings will start promptly each day. Also note that the "Breaks" in the agenda are tentative, depending on progress through the day's material.

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Appendix A. Release B Document Tree

This appendix illustrates the relationships among Release B's principal requirements and design documents.

A.1 System Requirements and Design Documents

Figure A-1, System Requirements and Design Documents, illustrates the hierarchy of the ECS project's principal system requirements and design documents. These documents apply to the ECS at the system level and, as applicable, are common across all Releases, including Release B. As applicable, documents approved by GSFC are identified by their GSFC-assigned document numbers.

A.2 Release B (CSMS/SDPS) Requirements and Design Documents

Figure A-2, Release B (CSMS/SDPS) Requirements and Design Documents, illustrates the hierarchy of the principal requirements and design documents that apply specifically to Release B (CSMS/SDPS).

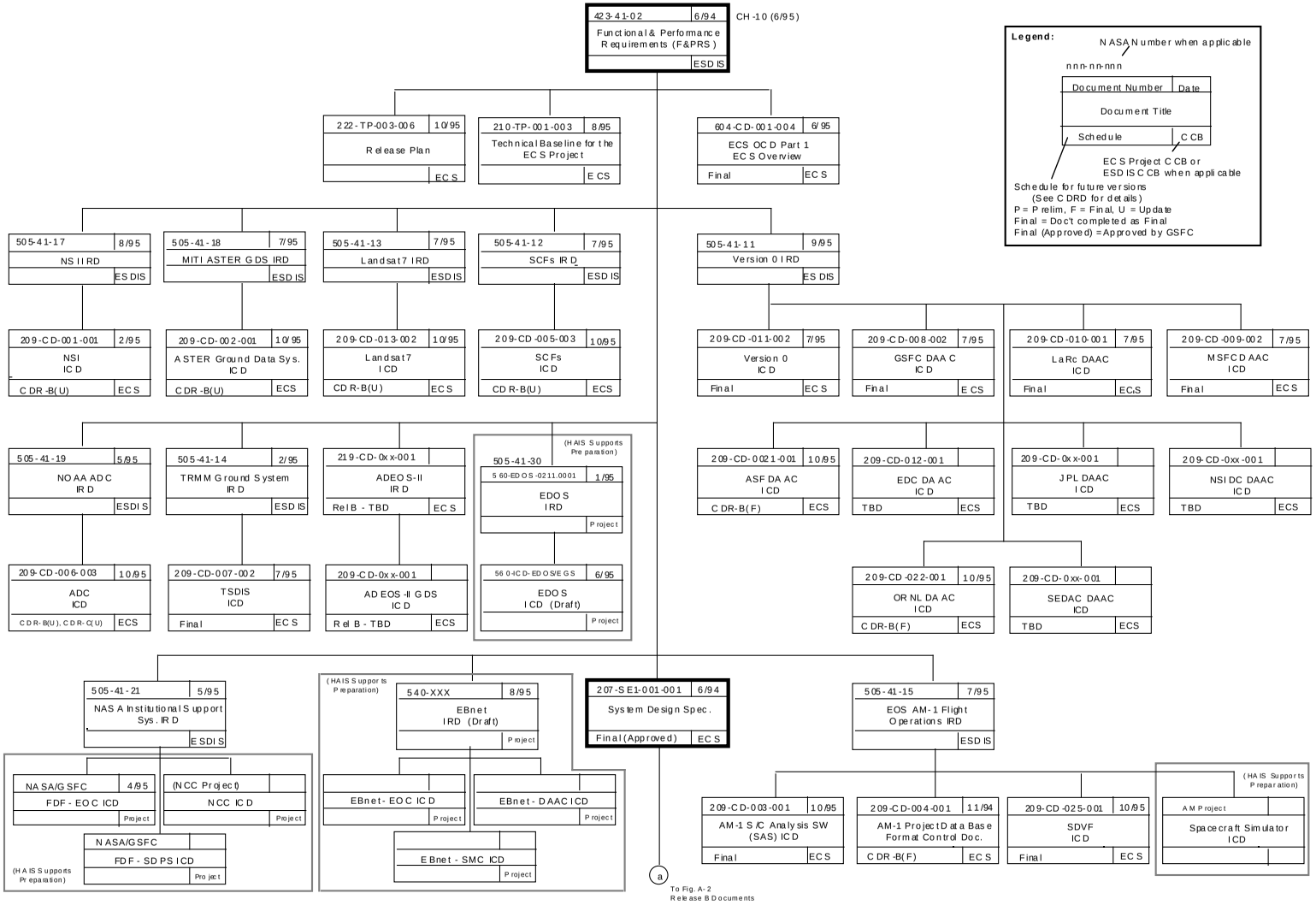

Figure A-1. System Requirements and Design Documents

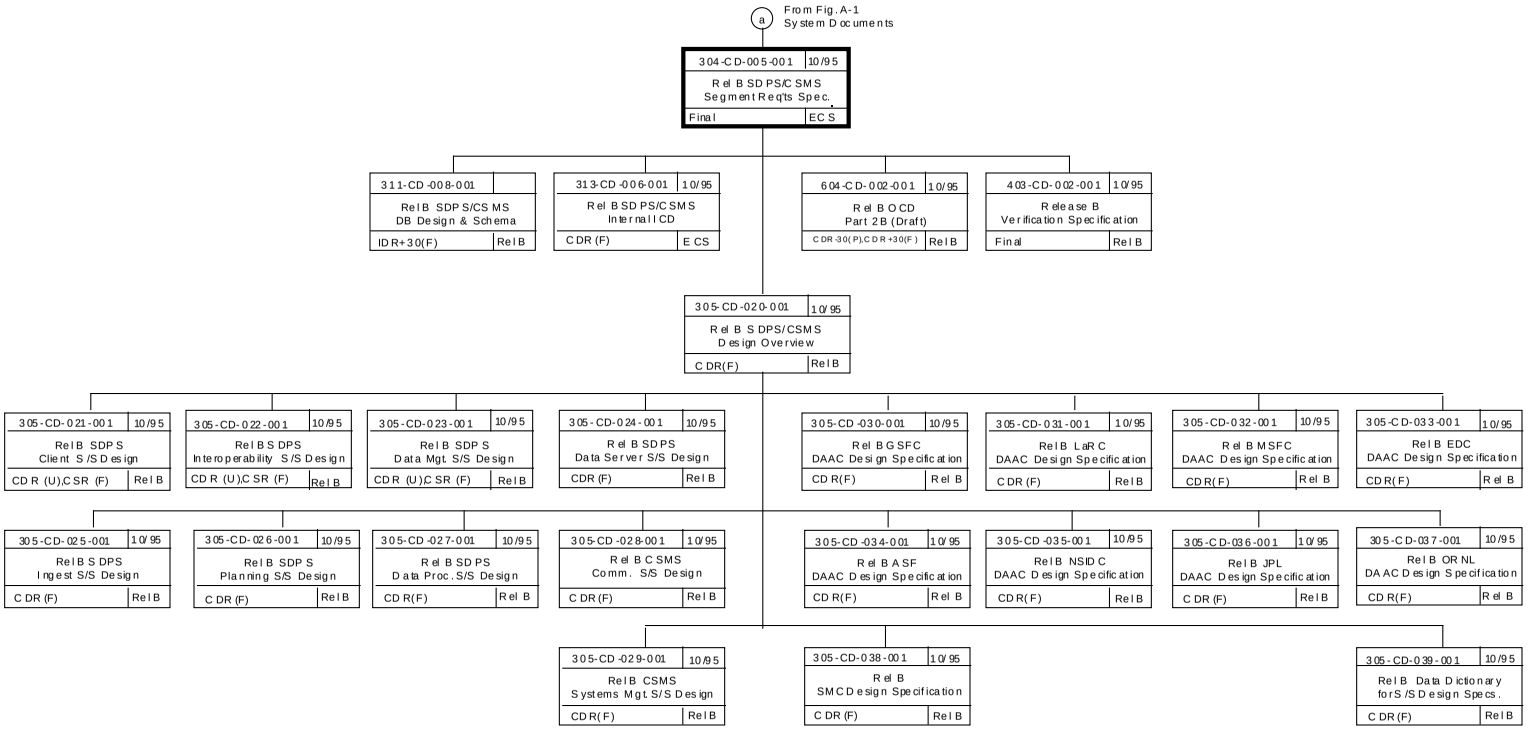

Figure A-2. Release B (CSMS/SDPS) Requirements and Design Documents

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Appendix B. Week-At-A-Glance Agenda

Monday	October 30. 1995
7:30 - 8:00 AM	Continental Breakfast
8:00 - 8:20 AM	Welcome, Objectives, Expectations
8:20 - 8:30 AM	Road to IDR
8:30 - 9:00 AM	IDR Overview
9:00 - 10:55 AM	Push Scenario Part I
10:55 - 11:10 AM	Break
11:10 - 12:45 PM	Push Scenario Part II
12:45 - 1:45 PM	Lunch
1:45 - 3:30 PM	Push Design Drill-Down Part I
3:30 - 3:45 PM	Break
3:45 - 5:30 PM	Push Design Drill-Down Part II
5:30 - 7:30 PM	Closed Review Panel Meeting

Tuesday	October 31, 1995
7:30 - 8:00 AM	Continental Breakfast
8:00 - 10:00 AM	Push Design Drill-Down Part III
10:00 - 10:15 AM	Break
10:15 - 12:00 PM	Pull Scenario Part I
12:00 - 1:00 PM	Lunch
1:00 - 3:00 PM	Pull Scenario Part II
3:00 - 3:15 PM	Break
3:15 - 5:30 PM	Pull Design Drill-Down Part I
5:30 - 7:00 PM	Open Demos
5:30 - 7:30 PM	Closed Review Panel Meeting

Wednesday	November 1, 1995
7:30 - 8:00 AM	Continental Breakfast
8:00 - 10:30 AM	Pull Design Drill-Down Part II
10:30 - 10:45 AM	Break
10:45 - 12:45 PM	Pull Design Drill-Down Part III
12:45 - 1:45 PM	Lunch
1:45 - 3:45 PM	Push + Pull Scenario
3:45 - 4:00 PM	Break
3:45 - 5:30 PM	Push + Pull Design Drill-Down Part I
5:30 - 7:00 PM	Open Demos
5:30 - 7:30 PM	Closed Review Panel Meeting

Thursday	November 2, 1995
7:30 - 8:00 AM	Continental Breakfast
8:00 - 10:00 AM	Push + Pull Design Drill-Down Part II
10:00 - 10:15 AM	Break
10:15 - 12:00 PM	Program Management Topics/Open Demos/Physical Design Posters
12:00 - 1:00 PM	Lunch
1:00 - 2:30 PM	Program Management Topics/Open Demos/Physical Design Posters
2:30 - 3:15 PM	Road to AM-1 Part I
3:15 - 3:30 PM	Break
3:30 - 5:30 PM	Road to AM-1 Part II
5:30 - 7:00 PM	Open Demos
5:30 - 7:30 PM	Closed Review Panel Meeting

Friday	November 3, 1995
7:30 - 8:00 AM	Continental Breakfast - Review Panel Only
8:00 - 1:00 PM	Closed Review Panel Meeting
1:00 - 2:00 PM	IDR-B Wrap-Up
2:00 PM	Adjourn

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Abbreviations and Acronyms

ACRIM	Active Cavity Radiometer Irradiance Monitor
ADEOS	Advanced Earth Observing Satellite (Japan)
ALT	Altimeter
AM	Morning (ante meridian)
AMSR	Advanced Microwave Scanning Radiometer
ASF	Alaska SAR Facility
CDR	Critical design review
CDRD	Contract Data Requirements Document
CERES	Clouds and Earth's Radiant Energy System
CLS	Client Subsystem
CSA	Canadian Space Agency
CSMS	Communications and System Management Segment
CSS	Communications Subsystem
DAAC	Distributed Active Archive Center
DAS	data assimilation system
DCE	Distributed Computing Environment
DDICT	Data Dictionary Services CSCI
DFA	Dual Frequency Altimeter
DIT	Design Integration Team
DME	distributed management environment
DMS	Data Management Subsystem
DPS	Data Processing Subsystem
DSS	Data Server Subsystem
EBnet	EOSDIS Backbone Network
ECS	EOSDIS Core System
EDC	EROS Data Center
EDHS	ECS Data Handling System
EDOS	EOS Data and Operations System

EOC	EOS Operations Center
EOS	Earth Observing System
EOSDIS	EOS Data and Information System
ERS	Earth Resources Satellite
ESDIS	Earth Science Data and Information System (Project)
ESN	EOSDIS Science Network
FOS	Flight Operations Segment (ECS)
GCDIS	Global Change Data and Information System
GDS	ground data system
GPCC	Global Precipitation Climatology Center
GPCP	Global Precipitation Climatology Project
GSFC	Goddard Space Flight Center
GV	ground validation data (TRMM)
HDF	Hierarchical data format
IATO	Independent Acceptance Test Organization
IAS	Imagery Assessment System
ICD	Interface Control Drawing
IDR	Incremental Design Review
INS	Ingest Subsystem
IOS	Interoperability Subsystem
IRD	Interface Requirement Document
ISCCP	International Satellite Cloud Climatology Project
IV&V	independent verification and validation
JERS	Japanese Earth Remote-Sensing Satellite
JPL	Jet Propulsion Laboratory
LAN	Local Area Network
LaRC	Langley Research Center
LIM	Local Information Manager
LIS	Lightning Imaging Sensor
LPS	Landsat Processing System
M&O	Maintenance and Operations

MISR	Multi-Angle Imaging SpectroRadiometer
MODIS	Moderate Resolution Imaging Spectrometer
MOPITT	Measurements of Pollution in the Troposphere
MR	Microwave Radiometer
MSFC	Marshall Space Flight Center
MSS	Management Subsystem
Nascom	NASA Communications Network
NOAA	National Oceanic and Atmospheric Administration
NOLAN	Nascomm Operational Local Area Network
NSI	NASA Science Internet
NSIDC	National Snow and Ice Data Center
ORNL	Oak Ridge National Laboratory
PDPS	Planning and Data Processing Subsystem
PDR	Preliminary Design Review
PLS	Planning Subsystem
PSCN	Program Support Communications Network
QA	Quality Assurance
SAR	Synthetic Aperture Radar
SAS	Spacecraft Analysis Software
SCDO	Science and Communications Development Office
SCF	Science Computing Facility
SDP	Science Data Plan
SDPF	Science Data Processing Facility
SDPS	Science Data Processing Segment
SEDAC	Socio-Economic Data and Application Center
SMC	System Monitoring and Coordination Facility
SMO	System Management Office
SSM	Special Sensor Microwave/Imager
TMI	TRMM Microwave Imager
TP	Technical Paper
TRMM	Tropical Rainfall Measuring Mission (joint US-Japan)

TSDIS	TRMM Science Data and Information System
URL	Uniform Resource Locator
V0	Version 0
VIRS	Visible Infrared Scanner
WAN	Wide Area Network